

Section No. 21.0
Revision No. 0
Date: 4/1/95

21.3.6 Bug Guide (Stream Macroinvertebrate Key)

BUG GUIDE

Families of Common Macroinvertebrates found in Northern Rocky Mtn. Streams

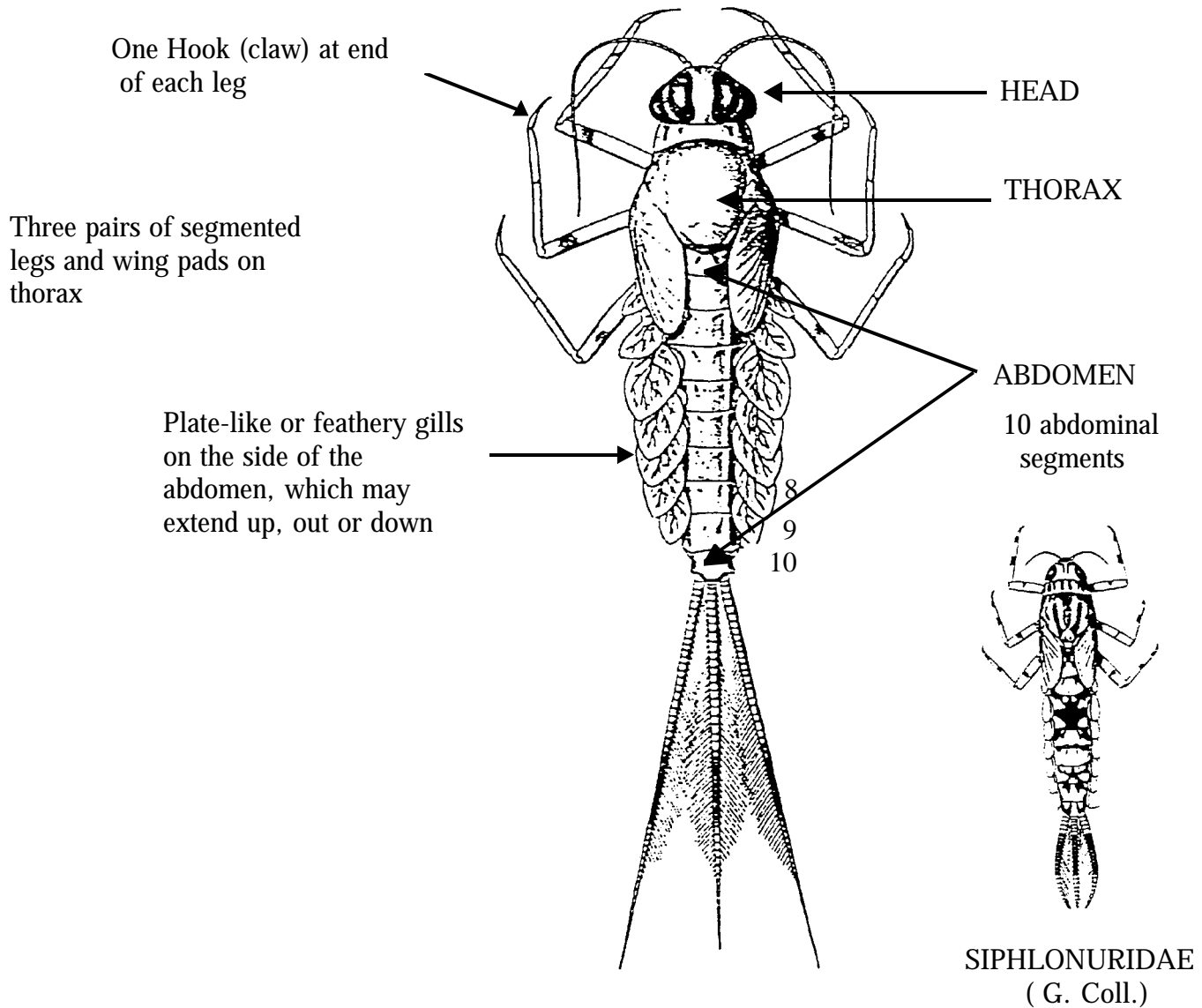
Prepared by:
Kootenai River Network:
Adopt-A-Stream Project

Jill Davies
December, 1994

Paid for with grants from:
The Bullitt foundation
Nat'l Fish & Wildlife Fndn.

Illustration by A.V. Provonsha
From W. Patrick McCaffery's
Aquatic Entomology
Jones & Bartlett Publishers 1983
Used by Permission

Characteristics of MAYFLIES (Order EPHEMEROPTERA)

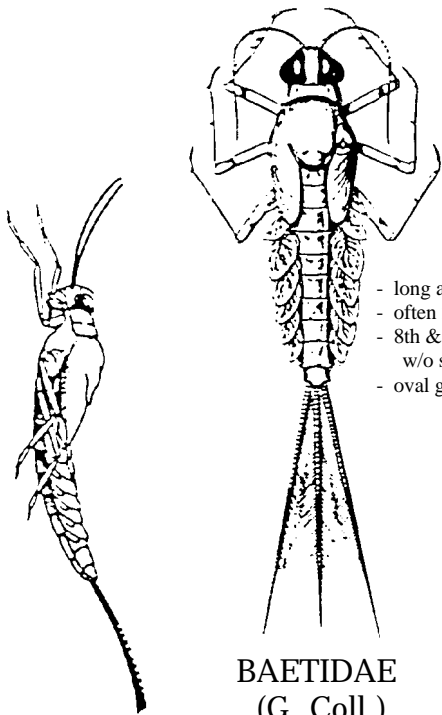


2 or 3 tails on abdomen

- oval gills
- short ant.
- 3 tails
- 8th & 9th abd seg have sharp spines

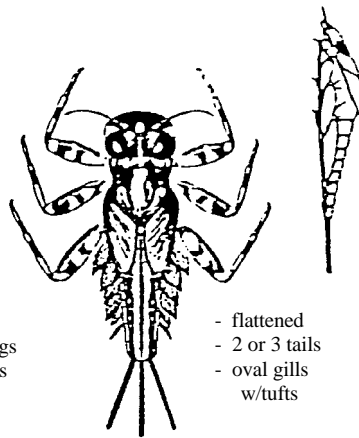
Typical size 3-20mm

Common MAYFLY Families (Order EPHEMEROPTERA)



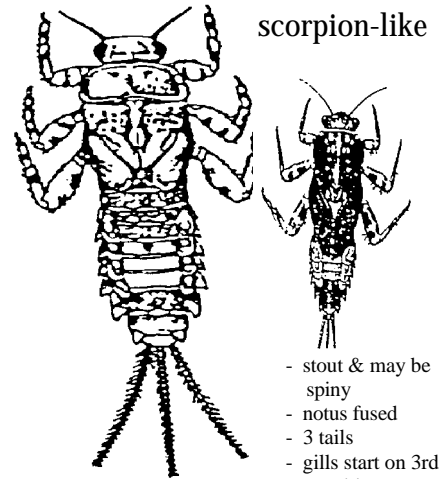
- long ant.
- often 2 tails
- 8th & 9th abd segs w/o sharp spines
- oval gills

BAETIDAE
(G. Coll.)



- flattened
- 2 or 3 tails
- oval gills w/tufts

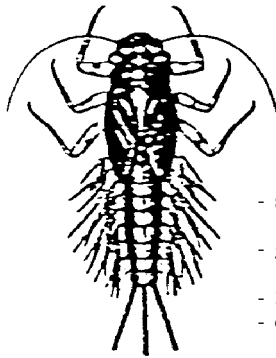
HEPTAGENIIDAE
(G. Coll., Scraper)



scorpion-like

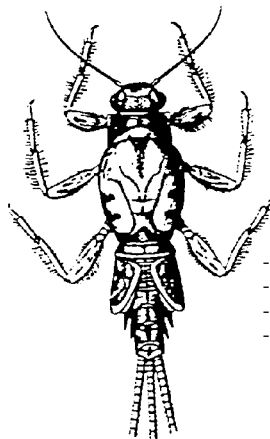
- stout & may be spiny
- notus fused
- 3 tails
- gills start on 3rd or 4th segs some with operculate gills

EPHEMERELLIDAE
(Scraper, G. Coll.)



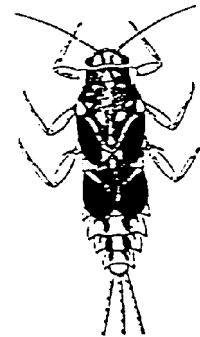
- sometimes flattened w/mandibles visible
- gills long, forked or in filaments
- 3 tails
- can have tusks

LEPTOPHLEBIIDAE
(G. Coll.)



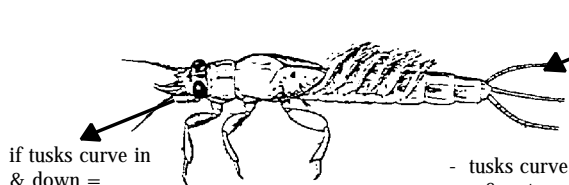
- small
- notus fused
- 3 tails
- gills on abd seg 2 operculate & triangular

TRICORYTHIDAE
(G. Coll.)



- notus fused
- 3 tails
- small
- gills on abd seg operculate & rectangular overlapping

CAENIDAE
(G. Coll.)

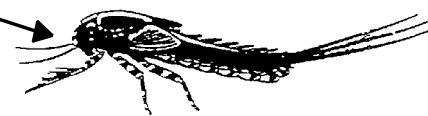


if tusks curve in & down =
Polymitarcyidae

EPHEMERIDAE
(G. Coll.)

- tusks curve up & out
- 3 tails
- large
- gills forked & fringed

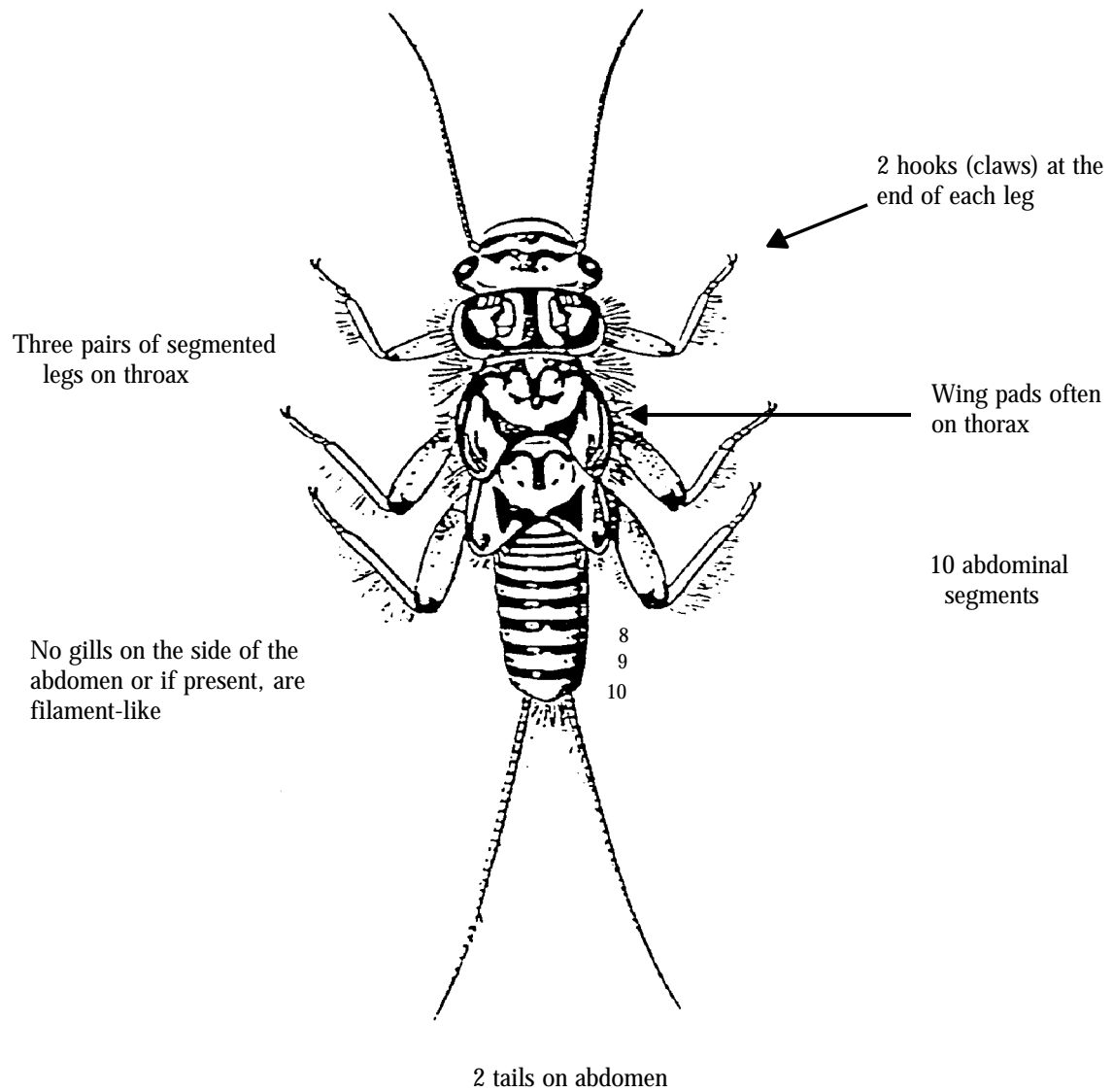
in large rivers



OLIGONEURIDAE
(F. Coll.)

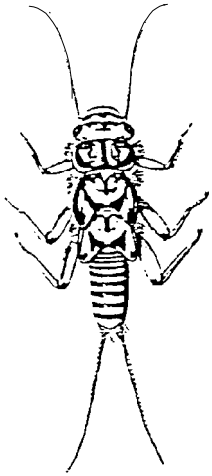
- forelegs w/long hairs
- round shape
- w/3 tails or
- flattened w/2 tails

Characteristics of STONEFLIES (Order PLECOPTERA)



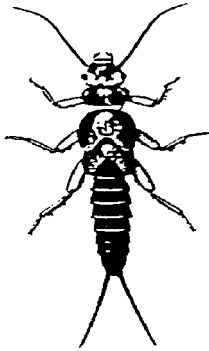
Typical Size 5-35mm

Common STONEFLY Families (Order PLECOPTERA)



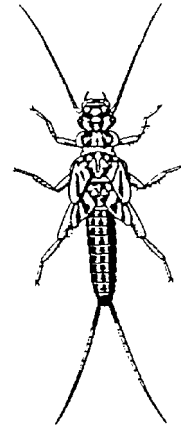
- patterned
- branched gills on thorax
- broad head
- large

PERLIIDAE
(Predator)



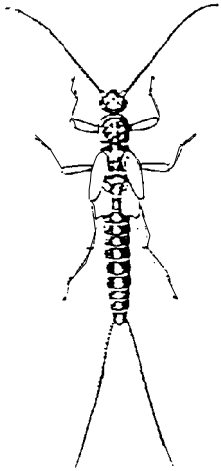
- greenish
- wing ↓
- rounded wing pads
- short tails

CHLOROPERLIDAE
(Predator)



- often patterned
- no gills or single gills
- wings ↘
- long tails
- broad head

PERLODIDAE
(Predator)



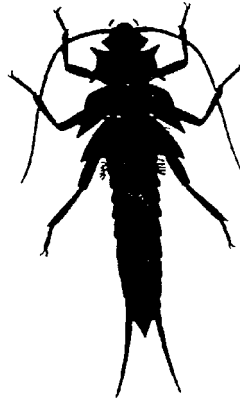
- small slender
- abd often thinner in middle
- wings ↓
- zig zag abd margin
- crease in abd side to seg 9

CAPNIIDAE
(Shredder)

Much Like

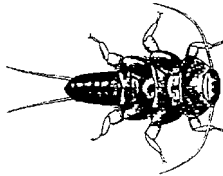
Leuctridae

- smooth abd margin
- creases in abd side to seg 7
- body very long
- abd even thickness



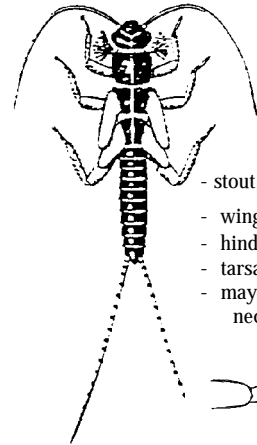
- large
- wings ↘
- gills under thorax & abd seg 1-3

PTERONARCYIDAE
(Shredder)



PERLOPERLIDAE
(Shredder)

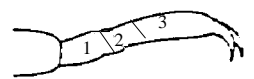
- roach-like
- plated
- branched gills under plates



- stout, hairy
- wing ↘
- hind legs > abd
- tarsal seg 2 < seg 1
- may have gills at neck

NEMOURIDAE
(Shredder)

Much Like



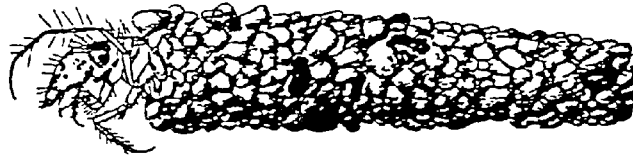
Taeniopterygidae

- tarsal seg 2 = seg 1
- can be patterned
- no gills at neck

Characteristic of CADDISFLIES (Order TRICHOPTERA)

Insect may be in a case made of
sand grains or bits of leaf or
twigs

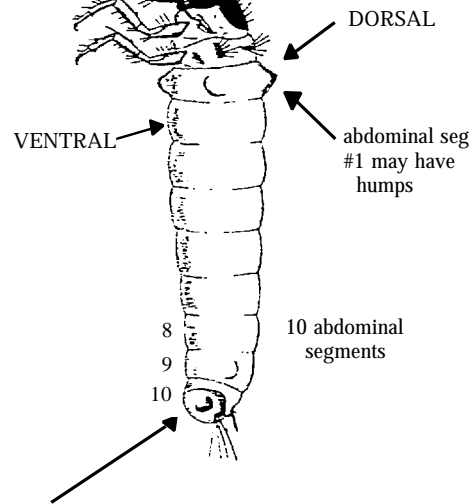
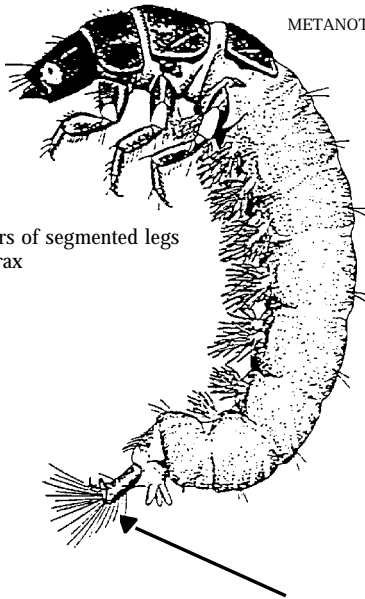
.....or may be free-living.....



PRONOTUM MESONOTUM
Thorax may be plated
METANOTUM

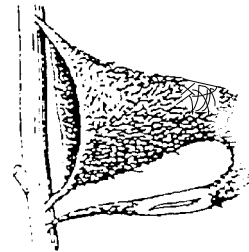
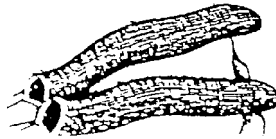
Three pairs of segmented legs on thorax

Filament-like gills may be present on the underside of the abdomen



Short or long prolegs at the end of the abdomen that end in a single hook

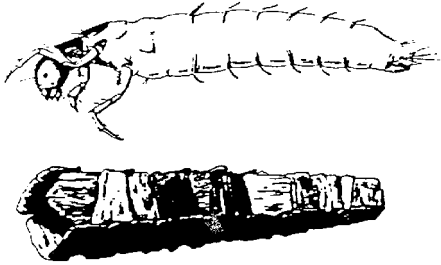
.....or may be in a tent or silk net



Typical Size 2-40 mm

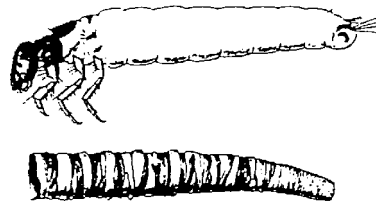
Common CADDISFLY Families (Order TRICHOPTERA)

Common CADDISFLY Families (Order TRICHOPTERA) Casebuilders



LEPIDOSTOMATIDAE
(Shredder)

- 2 plates, side humps
- spotted head
- cases vary



BRACHYCENTRIDAE
(F. Coll.)

- 2 plates, no humps
- pronotum w/ deep groove side to side



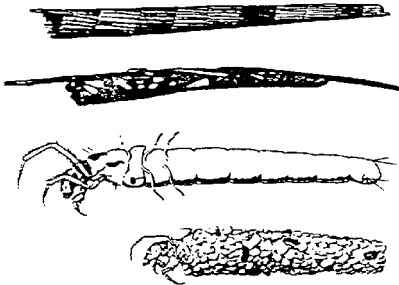
GLOSSOSOMATIDAE
(Scraper)

- 1 plate, no hump
- plate on 9th
- fused prolegs
- tortoise shell case



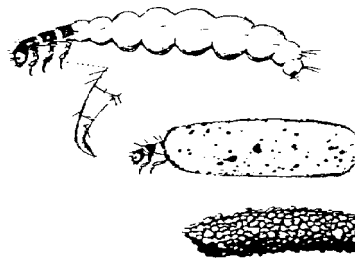
PHRYGANEIDAE
(Shredder)

- 1 plate, top hump
- large w/ long head
- gills on abd seg #1
- prosternal horn
- case in spiral



LEPTOCERIDAE
(G. Coll.)

- 2 plates, side humps
- "long" antennae near mandibles
- 2nd plate w/ 2 dark lines

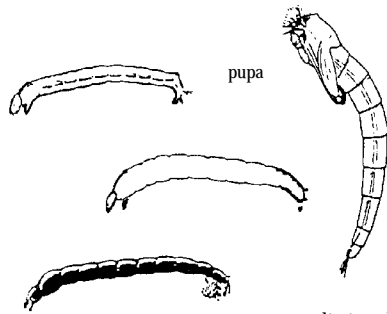


HYDROPTILIDAE
(G. Coll., Scraper)

- 3 plates, no hump
- small "micro-caddis"

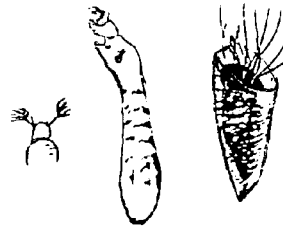


Common TRUE FLY Families (Order DIPTERA)



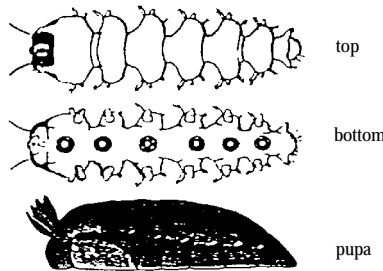
MIDGE
(CHIRONOMIDAE)
(G. Coll.)

- distinct head
- pair of prolegs at front of thorax
- may have prolegs at end of abd & brushes



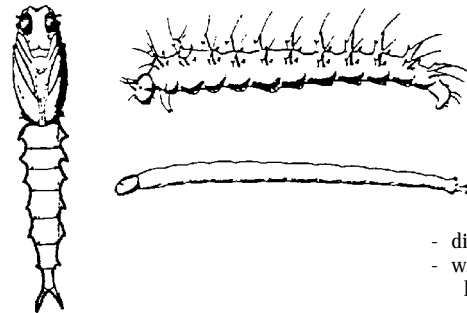
BLACK FLY
(SIMULIIDAE)
(F. Coll.)

- distinct head w/fan-like hairs
- abd segs 5-8 swollen
- one proleg at front of thorax
- abd end w/attachment disc



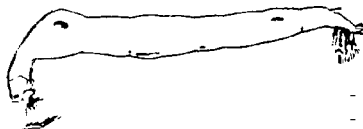
NET-WINGED MIDGE
(BLEPHARICERIDAE)
(Scraper)

- flattened body w/ 7 distinct segs
- suction disks on 6 segs
- head fused w/thorax & first abd seg



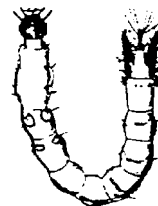
BITING MIDGE
(CERATOPOGONIDAE)
(Predator)

- distinct head
- w/prolegs & large bristles or
- w/out prolegs & smooth



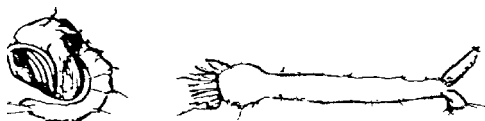
PHANTOM MIDGE
(CHAOBORIDAE)
(Predator)

- thorax enlarged & fused
- no mouth brushes
- ant. w/long hairs
- body compressed side to side
- sometimes transparent
- no prolegs



DIXID MIDGE
(DIXIDAE)
(G. Coll.)

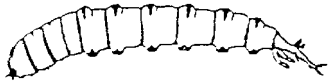
- slender
- head w/smooth brushes & ant.
- pair of prolegs on abd seg # 1 & sometimes on #2
- abd end with breathing tube & fringed lobes



MOSQUITOE
(CULICIDAE)
(F. Coll.)

- throat enlarged & fused
- body depressed top to bottom
- w/mouth brushes
- no prolegs
- abd end with breathing tube

Common TRUE FLY Families (Order DIPTERA)



ANTOCHA (G. Coll.)

- ridges w/plates on abd. top
- creeping welts under abd.



TIPULA (Shredder)



DICRANOTA (Predator)



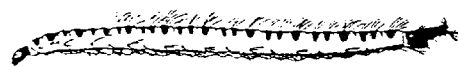
SNIPE FLY
(ATHERICIDAE)
(Predator)

- no distinct head
- 8 pr prolegs w/minute hooks
- short filaments on top & side
- abd end w/2 long fringed projection



DEER FLY
(TABANIDAE)
(Predator)

- no distinct head
- no prolegs
- body cylindrical, tapering at both ends
- w/fleshy rings

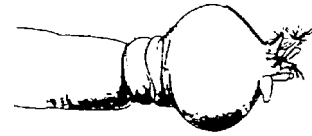


MOTH FLY
(PSYCHODIDAE)
(G. Coll.)

- no prolegs
- body segs subdivided
- round or flattened
- with dorsal plates
- may have attachments

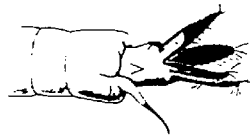
CANE FLY
(TIPULIDAE)

- no distinct head (usually retracted)
- cylindrical body
- end of abd forms disc w/various shaped lobes



HEXATOMA (Predator)

- abd end often swollen



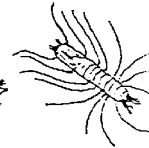
ORMOSIA (G. Coll.)



PSEUDOLIMNOPILA
(?)



DANCE FLY
(EMPIDIDAE)
(Predator)

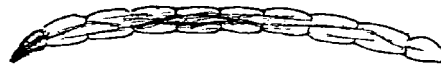


- no distinct head
- 7 or 8 prolegs
- abd end w/1 - 4 short projection



SOLDIER FLY
(STRATIOMYIDAE)
(G. Coll.)

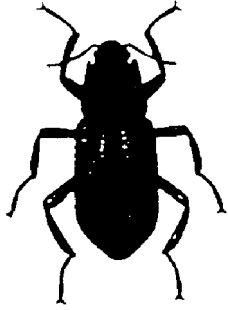
- distinct head
- no prolegs
- body hard w/CaCO₃ deposits
- bristles & terminal fan



PELECORHYNCHIDAE
(G. Coll.)

- long, smooth, slender
- somewhat transparent
- no prolegs, or any other structure
- no distinct head

Common BEETLE Families (Order COLEOPTERA)



- Larva:
- body long, plated
 - abd seg 3 has chamber w/gills & hooks
- Adult:
- long-legged
 - ant usually slender
 - sometimes short & clubbed
 - claws long & sharp

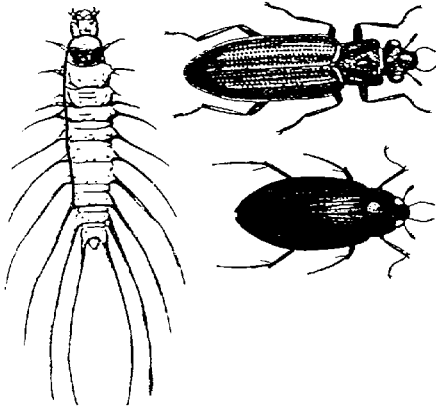


RIFFLE BEETLE
(ELMIDAE)
(G. Coll.)



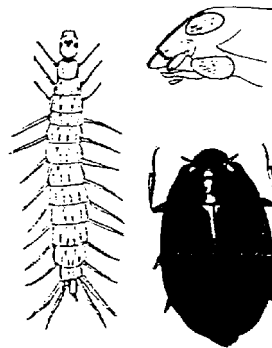
- Larva:
- can be quite long
 - legs slender
 - abd has 8 segs
 - abd tapered at end
- Adult:
- oval, streamlined body
 - slender ant.
 - hind legs w/long swimming hairs

PREDACEOUS DIVING BEETLE
(DYTISCIDAE)
(Predator)



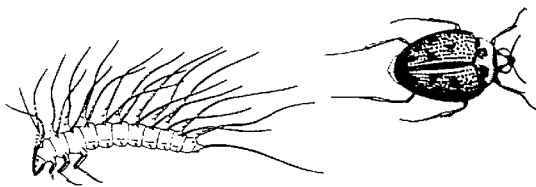
WATER SCAVENGER BEETLE
(HYDROPHILIDAE)
(Predator)

- Larva:
- mandibles visible from above
 - abd has 8 segs
 - abd looks wrinkled
 - no visible terminal filaments
- Adults:
- ant w/3 segmented club
 - hind legs w/hairs



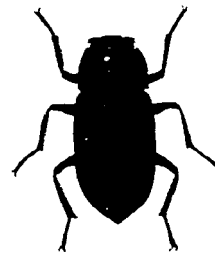
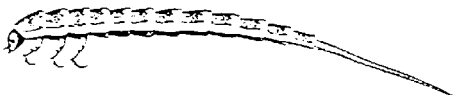
- Larva:
- elongate
 - abd w/lateral filaments
 - abd w/4 terminal hooks
- Adult:
- oval, flattened
 - eyes divided into dorsal & ventral prs
 - front legs long, mid & hind short

WHIRLIGIG BEETLE
(GYRINIDAE)
(Predator)



CRAWLING WATER BEETLE
(HALIPLIDAE)
(Shredder)

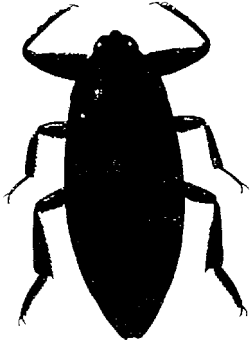
- Larva:
- elongate
 - single claws
 - abd end very elongate
 - may have long filaments
- Adult:
- oval, usually spotted
 - hind legs w/hairs
 - plates cover base of legs



- Larva: (not shown)
- terrestrial
- Adult:
- ant short, thick
 - never clubbed
 - long claws

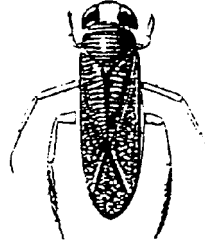
LONGTOED WATER BEETLE
(DRYOPIDAE)
(Shredder)

Common WATER BUG Families (Order HEMIPTERA)



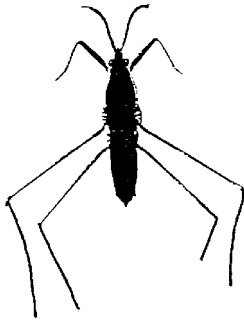
**GIANT WATER BUG
(BELOSTOMATIDAE)**
(Predator)

- large, up to 65mm
- oval, somewhat flattened
- forelegs modified to hold prey w/1 or 2 claws
- abd does not end in tubes or rod-like structures



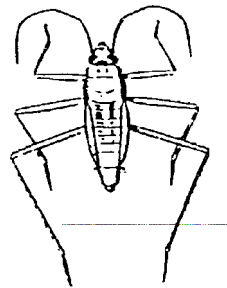
**WATER BOATMAN
(CORIXIDAE)**
(Predator)

- parallel-sided, 3-11mm
- short, modified beak
- short, modified forelegs
- hind legs oarlike & possess swimming hairs



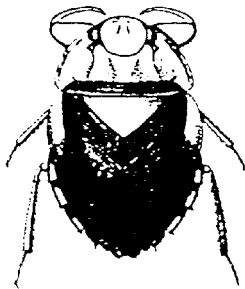
**WATER STRIDER
(GERRIDAE)**
(Predator)

- surface dweller, 3-20mm
- very long hind & mid legs
- claws arise just before end of legs



**WATER TREADER
(MESOVELIIDAE)**
(Predator)

- small, 2-4mm
- legs slender w/scattered spines
- surface dweller mostly on ponds



**CREEPING WATER BUG
(NAUCORIDAE)**
(Predator)

- oval, flattened, 6-15mm
- forelegs modified for holding prey
- forelegs w/single claw

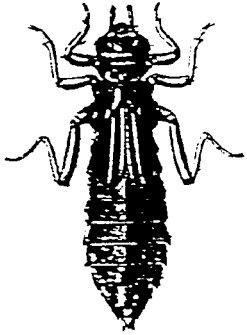


**BACKSWIMMERS
(NOTONECTIDAE)**
(Predator)

- elongate, deep bodied
- patterned, 5-16mm
- forelegs w/2 claws
- hind legs barlike w/swimming hairs
- swim upside down

Common DAMSELFLY and DRAGONFLY Families (Order ODONATA) One ALDERFLY Family (Order MEGALOPTERA)

DRAGONFLY LARVA (Order ODONATA, Suborder ANISOPTERA)



CLUBTAIL (GOMPHIDAE) (Predator)

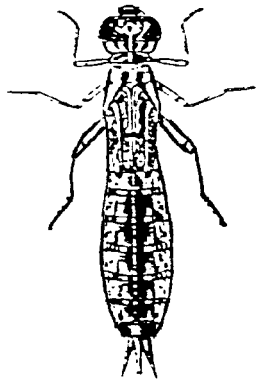
- robust antennae
- labium is flat
- 23-40mm
- tarsus of mid leg is two-segmented

DAMSELFLY LARVA (Order ODONATA, Suborder ZYGOPTERA)

BROADWINGED DAMSELFLY (CALOPTERYGIDAE) (Predator)



- long, slender, long-legged
- seg 1 of ant. very long
- 3 tail feathers are long, slender, w/mid less so



DARNER (AESHNIDAE) (Predator)

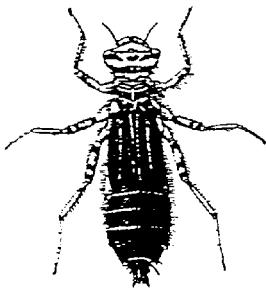
- patterned, elongate
- abd tapered at end
- 31-50mm
- labium is flat
- slender ant. & legs

SPREADWINGED DAMSELFLY (LESTIDAE) (Predator)



- long, slender, 20-29mm
- labium very long & stalklike
- 3 tails leaflike

NARROWWINGED DAMSELFLY (COENAGRIONIDAE) (Predator)



COMMON SKIMMER (LIBELLULIDAE) (Predator)

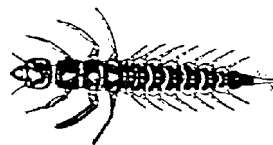
- hairy, 8-28mm
- slender ant.
- labium spoon-shaped



- short, 13-25mm
- robust body
- 3 tail feathers often broad, pointed at tips

ALDERFLY (Order MEGALOPTERA, Family SIAIDAE) (Predator)

- abd w/7 pairs of lateral filaments
- single, long terminal filaments w/hairs



Common MOLLUSK Families (Phylum MOLLUSCA)

SNAILS & LIMPETS (Class GASTROPODA)

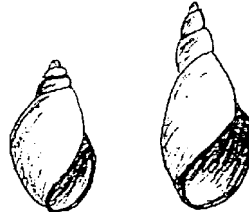
Single spiral shell

Typical size 2 - 70 mm

LIMPET (ANCYLIDAE) (Scraper)



- shell w/out a spiral structure



GILLED SNAIL (LYMNAEIDAE) (Scraper)

- shell opening to the right
- has trap door at opening
- rely on O_2 in the water

(PLANORBIDAE) (Scraper)



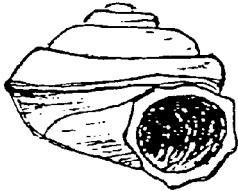
- spiral of shell in one plane



POUCH or POND SNAIL (PHYSIDAE) (Scraper)

- shell opening to the left
- no trap door at opening
- gets O_2 from the air

ROUND-MOUTHED SNAIL (VALVATIDAE) (Scraper)



- spiral of shell very low

(Large clams, over 2", of the familie
Margaretiferidae & Unionidae
may be found in large rivers
east of the Rockies.)

CLAMS (Class BIVALVIA)

Two-piece hinged shell

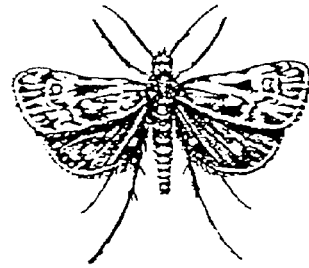
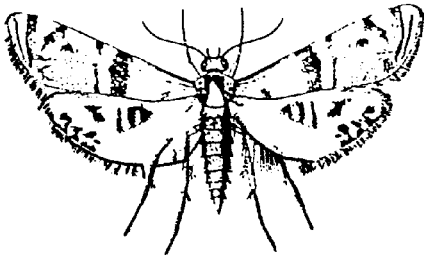
Typical size 2 - 6mm



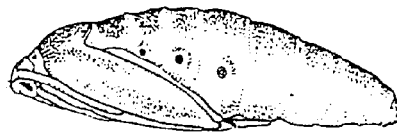
FINGERNAIL CLAM (SPHAERIIDAE) (F. Coll.)

- small, < inch

Common AQUATIC MOTH Families (Order LEPIDOPTERA)



pupa



(PYRALIDAE)
Petrophila confusalis
(F. Coll., Scraper)

(PYRALIDAE)
Synclita occidentalis
(F. Coll., Scraper)

Larva:

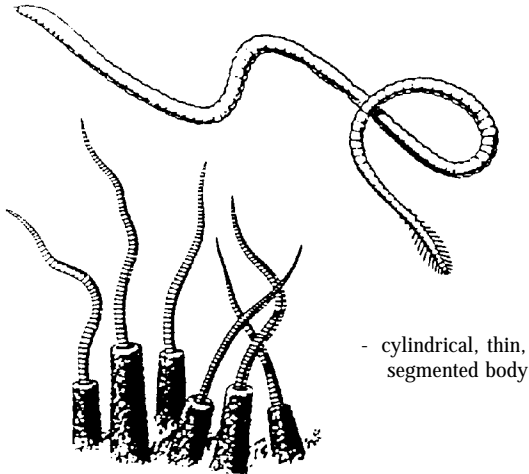
- gills may be on thorax & abdomen
- prolegs on abd segs #3-5 & #10 w/circles of hooks
- live in tent-like silk retreat
- in streams

Larva:

- same as *Petrophila*
- usually in ponds, lakes

OTHER COMMON BENTHIC MACROINVERTEBRATES

AQUATIC WORM
(Class OLIGOCHAETA)
(G. Coll.)



- cylindrical, thin, segmented body

LEECH
(Class HIRUDINEA)
(Predator)



- worm-like, flattened, wide, segmented body
- suckers on underside at both ends

NEMATODE
(Class NEMATODA)
(Omnivore)



- small, cylindrical worms. .5 - 2 mm
- often translucent
- mouth at truncated or rounded end
- posterior end tapered
- not segmented

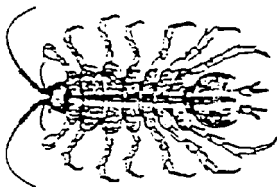
PLANARIAN
(Class TURBELLARIA)
(Predator)



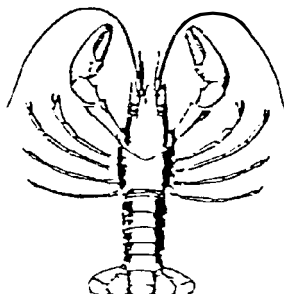
- soft, flattened body, unsegmented
- lobed or arrow shaped head w/eye spots

CRUSTACEANS

SOWBUGS
Order ISOPODA
(Shredder)



CRAYFISH
Order DECAPODA
(Predator)



SCUDS
Order AMPHIPODA
(Shredder)

